MANAGEMENT PLAN FOR THE BUNKER HILL AREA OF DRILLING CONCERN

I. GENERAL

A. Introduction

The Bunker Hill Area of Drilling Concern is located in northern Idaho within Shoshone county. Because of past mining activities the ground water within the Area of Drilling Concern does not meet EPA Public Drinking Water Standards in most areas and could be a threat to public health. If wells are drilled, modified, reconstructed or abandoned at well construction standards that do not exceed the minimum standards, potential for aquifer contamination could occur. This requires that well construction standards for the Area of Drilling Concern be implemented that exceed the minimum standards set by the Idaho Water Resource Board. The Bunker Hill Superfund Site is located within the Area of Drilling concern boundary.

A brief hydrogeological, mining and smelting and contaminate description is listed within the Bunker Hill Area of Drilling Concern Document. A comprehensive report for the Bunker Hill Superfund Site was prepared by McCulley, Frick and Gilman for the remedial investigation of the superfund site. This document is titled Bunker Hill Superfund Site Remedial Investigation Report, Volumes I and II, May 1, 1992.

II. STATUTORY REQUIREMENTS AND AUTHORITIES

A. Section 42-238(4), Idaho Code, Well construction standards. The water resource board shall adopt minimum standards for water well construction, low temperature geothermal resource well construction and geothermal well construction in this state under the provisions of chapter 52, title 67, Idaho Code. Such standards shall require each well to be so constructed as to protect the ground water of the state from waste and contamination and may include additional requirements for wells drilled in "areas of drilling concern" as designated in accordance with subsection (7) of this section. Every licensed well driller will be furnished a copy of the adopted standards by the director of the department of water resources, and will be required to construct each well drilled after July 1, 1987, in compliance with the adopted standards.

B. Section 42-238(7), Idaho Code, Drilling in a designated "area of drilling concern". The director of the department of water resources may designate as he determines necessary, "areas of drilling concern" on an aquifer by aquifer basis within which drillers must comply with the additional requirements of this section. The director shall designate "areas of drilling concern" to protect public health and to prevent waste or contamination of ground or surface water because of factors such as aquifer pressure, vertical depth of the aquifer, warm or hot ground

water, or contaminated ground or surface waters. It is unlawful for any person not meeting the requirements of this subsection to drill a well for any purpose in a designated "area of drilling concern". Any person drilling a new well or deepening or modifying an existing well for any purpose in an "area of drilling concern" as designated by the director as herein provided shall comply with the following additional requirements:

(a) Additional bonding requirements, as determined by the director, to insure that the well is constructed or abandoned in compliance with the adopted standards for well construction.

(b) Additional experience and knowledge in drilling wells encountering warm water or pressurized aquifers as required by rules and regulations adopted by the water resource board.

(c) Document that specialized equipment needed to drill wells in "areas of drilling concern," as determined by the director, is or will be available to the driller.

(d) Provide a notice of intent to drill, deepen or modify a well, submit plans and specifications for the well and a description of the drilling methods that will be used, as required by the director, and receive the written approval of the director before commencing to drill, deepen, or modify any well in a designated "area of drilling concern".

Prior to designating an "area of drilling concern," the director shall conduct a public hearing in or near the area to determine the public interest concerning the designation. Notice of the hearing shall be published in two (2) consecutive weekly issues of a newspaper of general circulation in the area prior to the date set for hearing.

In the event an area has been designated as an "area of drilling concern" and the director of the department of water resources desires to remove such designation or modify the boundaries thereof, he shall likewise conduct a public hearing following similar publication of notice prior to taking such action.

C. Section 42-235, Idaho Code, provides that prior to constructing or drilling any well, an owner shall obtain a permit from the director of the department of water resources, to protect the public health, safety and welfare and the environment and to prevent the waste or mixture of any water from a well. There shall be a thirty-five dollar ($35.00) charge for the permit if the well is to be used for domestic or monitoring purposes. If the well is to be used for other than domestic or monitoring purposes, the charge for the permit shall be two **hundred** dollars ($200). All moneys received pursuant to this section shall be credited to the water administration account. The director may provide a blanket drilling permit for site specific monitoring programs which will determine the quality, quantity, temperature, pressure or other attributes of aquifers. The application for a blanket permit shall be submitted by a licensed engineer or licensed geologist and shall describe the overall drilling program and all relevant technical features of

the wells to the satisfaction of the director. Progress reports, completion and other data may be required as provided by rule and regulation. The fee for the blanket permit shall be fifty dollars ($50.00) plus an additional twenty-five ($25.00) per well. A person violating any provision of this section shall be guilty of a misdemeanor.

D. Section 42-237a.b., Idaho Code, provides to require both flowing and nonflowing wells to be so constructed and maintained as to prevent the waste of ground waters through leaky wells, casing, pipes, fittings, valves or pumps either above or below land surface.

III. MANAGEMENT POLICY

This management policy for the-Bunker Hill Area-of Drilling Concern includes a requirement for well drilling, abandonment, modification and reconstruction plans and specifications to be prepared by a licensed engineer or a licensed geologist which will include a specified order of operation with the following information: date work will commence, representative doing the work, type of work that will be done and how it will be accomplished. It shall also include lithology and static water level expected to be encountered along with a detailed drawing of the well bore and well construction. An application for a drilling permit must then be submitted to the department along with the plans and specifications for approval before a permit will be issued.

The designation of a management plan for the Bunker Hill Area of Drilling Concern is a preferred management policy. Under this policy, approval of drilling permits can be granted upon a showing by the person and a determination by the department that a risk to public health and contamination potential within the aquifer system will not increase if the work requested is permitted.

For the Department of Water Resources to review an application for a drilling permit the completed application must be submitted along with plans and specifications for the well. Along with this information a map will be included showing the location of the well to be drilled. Drilling permits that request the use of water from the lower aquifer will also be conditioned to require the upper aquifer to be cased and thoroughly sealed from the lower aquifer system. Upon review of this information the department may approve and permit the proposed well or deny the request if it is believed that a risk to public health or a potential of increased aquifer contamination could occur if the proposed well was drilled as planned. Additional information or alteration of construction plans could be sent to the Department of Water Resources for reevaluation of the application for approval.

For wells that are presently being used and require repair or reconstruction this management plan would require that plans

and specifications will be prepared by a licensed engineer or licensed geologist and submitted to the department. A map showing the location of the well must also be included. The department would then review the proposed work and permit it, deny it, or permit it with conditions.

For wells that are to be abandoned within the Area of Drilling Concern an abandonment method has been agreed upon during the remedial investigation for the Bunker Hill Superfund Site. This abandonment method will also be followed in the Bunker Hill Management Plan. If abandonment is planned the well owner must submit to the department a well abandonment form outlining the proposed work as required by the following three well categories used for well closure purposes:

1) small diameter wells with a diameter of less than five feet,

2) large diameter wells with a diameter greater than five feet and

3) monitoring/aquifer test wells.

The following closure plans are considered minimum standards for well abandonment set by the department. If the well owner can provide to the Department of Water Resources an alternate method of closure prepared by a licensed engineer or licensed geologist that would assure adequate protection to the aquifer system this plan would be review by the department and they could permit it, deny it, or permit it with conditions. The closure plan for small diameter wells is as follows:

1) wells that are located within the area of downward vertical hydraulic gradient and are completed within the lower aquifer zone will be pressure grouted and sealed in the following manner. Through available lithological data a 10-foot interval of casing spanning the confining layer/upper aquifer interface will be perforated and slurried sealing material will be placed under pressure with a tremie pipe from the bottom of the well to the top. After pressure has been released, the well will then be backfilled with sealing material to ground surface.

2) wells that are located within the area of upward vertical hydraulic gradient and completed within the lower zone and wells that are completed within the upper zone throughout the Area of Drilling Concern will be closed in the following manner. Sealing material will be placed from the bottom of the well to the top using a tremie pipe.

There are two alternate plans for the closure of large diameter wells within the area of drilling concern. The plans are as follows:

1) alternate 1 is the same as the closure plan for small diameter wells. These large diameter wells will not require perforation but a slurried sealing material will be placed with a tremie pipe from the bottom of the well to the top. The well will

then be backfilled with sealing material to ground level.

2) alternate 2 will use a tremie pipe located at or near the bottom of the well. A gravel/cobble mixture will be placed in the well in ten foot increments and the slurried sealant material injected into the gravel/cobble matrix. When the upper surface of the sealing material stabilizes at the top of the gravel/cobbles, the tremie pipe will be pulled up to the surface of the gravel/cobble mixture. The process will be repeated until the well is backfilled with the gravel/cobble matrix and sealing material to ground surface.

The monitoring/aquifer test wells will be closed as follows:

1) monitoring/aquifer test wells will be closed using a tremie pipe, placing a slurried sealant from the bottom of the well to the top. Since monitoring/aquifer test wells are usually constructed of PVC pipe and are completed with an annular seal of bentonite or similar material across the confining zone, the potential for interzonal leakage is considered very low. These wells will then be closed in the above manner and will not be dependant on location or depth of completion. Abandonment of these wells will occur when the well is no longer required for data.

DATED this 3RD **day of** JUNE **, 1994**

R. KEITH HIGGINSON, Director
Idaho Department of Water Resources